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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/726,569	12/04/2003	Haihong Wang	H1504	5105

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EXAMINER

NGUYEN, DILINH P

ART UNIT	PAPER NUMBER
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2814

DATE MAILED: 04/05/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

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<b>Office Action Summary</b>	Application No. 10/726,569	Applicant(s) WANG ET AL.	
	Examiner DiLinh Nguyen	Art Unit 2814	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 04 January 2006.  
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-5 and 15-22 is/are pending in the application.  
4a) Of the above claim(s) 20-22 is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1-5 and 15-19 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)               | Paper No(s)/Mail Date. _____  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>10/12/05</u>  | 6) <input type="checkbox"/> Other: _____                                    |

### DETAILED ACTION

Newly submitted claims 20-22 are directed to an invention that is independent or distinct from the invention originally claimed. (claims 1-5 and 15-19).

Since applicant had received an action on the merits for the originally presented invention, this invention has been constructively by original presentation for prosecution on the merits. Accordingly, newly submitted claims 20-22 are withdrawn from consideration. See 37 CFR 1.142(b) and MPEP § 821.03.

### ***Double Patenting***

1. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

2. Claims 1-3 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-2, 4-6 and 9 of U.S. Patent No. 6,762,448 in view of Ando (U.S. Pub. 2004/0108545).

Lin et al. (U.S. Pat. 6762448, claims 1-2, 4-6 and 9) substantially disclose all the limitations as claimed except for fin structures formed from amorphous silicon.

However, Ando discloses a semiconductor device comprising a fin structure comprising a crystalline silicon material formed from amorphous silicon (paragraph 0006, lines 3-5). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device structure of Lin et al. by having a crystalline silicon fin material formed from amorphous silicon because as taught by Ando, such the amorphous silicon would provide high performance and area efficient fin type structure (paragraph 0009).

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-5 and 15-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Datta et al. (U.S. Pub. 2005/0073060) (previously applied) in view of Ando (U.S. Pub. 2004/0108545) (newly cited).

- Regarding claim 1, Datta et al. discloses a semiconductor device comprising:
  - a plurality of fin structures 410 comprising a silicon material (last page, right column, line 10);
  - a source region formed at one end of the fin structures;
  - a drain region formed at an opposite end of the fin structures; and
  - at least one gate  $G_L$  (figs. 4-5 and paragraph 0029).

Datta et al. do not disclose the fin structure comprising a crystalline silicon material formed from amorphous silicon.

However, Ando discloses a semiconductor device comprising a fin structure comprising a crystalline silicon material formed from amorphous silicon (paragraph 0006, lines 3-5). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device structure of Lin et al. by having a crystalline silicon fin material formed from amorphous silicon because as taught by Ando, such the amorphous silicon would provide high performance and area efficient fin type structure (paragraph 0009).

It is noted that the process limitation: "...using metal-induced crystallization (MIC)..." does not carry weight in a claim drawn to structure.

Initially, and with respect to claims 1-5, note that a "product by process" claim is directed to the product *per se*, no matter how actually made. See In re Thorpe et al., 227 USPQ 964 (CAFC, 1985) and the related case law cited therein which makes it clear that it is the final product *per se* which must be determined in a "product by process" claim, and not the patentability of the process, and that, as here, an old or obvious product produced by a new method is not patentable as a product, whether claimed in "product by process" claims or not. As stated in Thorpe,

Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself, *In re*

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*Brown*, 459 F.2d 531, 535, 173 USPQ 685, 688 (CCPA 1972); *In re Pilkington*, 411 F.2d 1345, 1348, 162 USPQ 145, 147 (CCPA 1969); *Buono v. Yankee Maid Dress Corp.*, 77 F. 2d 274, 279. 26 USPQ 57, 61 (2d. Cir, 1935).

- Regarding claim 2, Datta et al. discloses that a width of each of the fin structures ranges from about 60nm [600 Angstroms] (fig. 8, paragraph 0029).
- Regarding claim 3, Datta et al. discloses that the plurality of fin structures is two fin structures (fig. 5).
- Regarding claim 4, Datta et al. discloses that a pitch associated with the fin structures is about 60nm [600 Angstroms] (fig. 8, paragraph 0029).
- Regarding claim 5, Datta et al. discloses that a height of each of the fin structures ranges from about 60nm [600 Angstroms] (fig. 8, paragraph 0029).
- Regarding claim 15, Datta et al. discloses a semiconductor device comprising:

a substrate 402;

a plurality of silicon fin structures 410 formed on the substrate,

a source region formed at one end of the fin structures;

a drain region formed at an opposite end of the fin structures; and

one or more gates  $G_L$  (figs.4-5 and 8).

Datta et al. do not explicitly disclose a center-to-center distance between each of the fin structures being about 600 Angstroms. However, Datta et al. disclose that the fins are separated by a distance  $D_s$  of 60 nm [600 Angstroms] or less (paragraph 0039, lines 15-16 and paragraph 0045, lines 12-13). Therefore, a center-to-center distance

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between each of the fin structures of Datta et al. would be about 600 Angstroms if the distance  $D_s$  is less than 60 nm [600 Angstroms].

Moreover, the distance range would have been obvious to an ordinary artisan practicing the invention because, absent evidence of disclosure of criticality for the range giving unexpected results, it is not inventive to discover optimal or workable ranges by routine experimentation. *In re Aller*, 220 F.2d 454, 105 USPQ 233, 235 (CCPA 1955). Furthermore, the specification contains no disclosure of either the critical nature of the claimed dimensions of any unexpected results arising therefrom. Where patentability is aid to be based upon particular chosen dimensions or upon another variable recited in a claim, the Applicant must show that the chosen dimensions are critical. See *In re Woodruff*, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

Datta et al. do not disclose the fin structure comprising a crystalline silicon material formed from amorphous silicon.

However, Ando discloses a semiconductor device comprising a fin structure comprising a crystalline silicon material formed from amorphous silicon (paragraph 0006, lines 3-5). Therefore, it would have been obvious to one having ordinary in the art at the time the invention was made to modify the device structure of Lin et al. by having a crystalline silicon fin material formed from amorphous silicon because as taught by Ando, such the amorphous silicon would provide high performance and area efficient fin type structure (paragraph 0009).

It is noted that the process limitation: "...using metal-induced crystallization (MIC)..." does not carry weight in a claim drawn to structure.

Initially, and with respect to claims 15-19, note that a "product by process" claim is directed to the product *per se*, no matter how actually made. See In re Thorpe et al., 227 USPQ 964 (CAFC, 1985) and the related case law cited therein which makes it clear that it is the final product *per se* which must be determined in a "product by process" claim, and not the patentability of the process, and that, as here, an old or obvious product produced by a new method is not patentable as a product, whether claimed in "product by process" claims or not. As stated in Thorpe,

Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself, *In re Brown*, 459 F.2d 531, 535, 173 USPQ 685, 688 (CCPA 1972); *In re Pilkington*, 411 F.2d 1345, 1348, 162 USPQ 145, 147 (CCPA 1969); *Buono v. Yankee Maid Dress Corp.*, 77 F. 2d 274, 279. 26 USPQ 57, 61 (2d. Cir, 1935).

- Regarding claim 16, Datta et al. discloses that a width of each of the fin structures ranges from about 60nm [600 Angstroms] (fig. 8, paragraph 0029).
- Regarding claim 17, Datta et al. discloses that the plurality of fin structures is two fin structures (fig. 5).
- Regarding claim 18, Datta et al. discloses that the plurality of fin structures is more than two fin structures (paragraph 0029, line 21).



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- Regarding claim 19, Datta et al. discloses that a height of each of the fin structures ranges from about 60nm [600 Angstroms] (fig. 8, paragraph 0029).

### ***Response to Arguments***

Applicant's arguments with respect to claims 1-5 and 15-19 have been considered but are moot in view of the new ground(s) of rejection. See the above new ground of rejection.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DiLinh Nguyen whose telephone number is (571) 272-1712. The examiner can normally be reached on 8:00AM - 6:00PM (M-F).

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on (571) 272-1705. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DLN

A handwritten signature in black ink, appearing to read 'Hoai Pham', with a stylized, flowing script.

HOAI PHAM  
PRIMARY EXAMINER